

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-172867

(43)Date of publication of application : 26.06.2001

(51)Int.Cl.

D06M 14/04
D06M 15/263

(21)Application number : 11-361503

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(22)Date of filing : 20.12.1999

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(54) FIBER STRUCTURE HAVING EXCELLENT FASTNESS TO LIGHT

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain both a fiber structure and a fiber product having increased hygroscopicity without impairing a feeling as yarn or a fabric such as woven fabric, knit fabric, nonwoven fabric, etc., and excellent fastness to light.

SOLUTION: This fiber structure is characterized in that the structure comprises ≤ 70 wt.% of fiber subjected to graft polymerization with a hydrophilic vinyl-based monomer and has class 3 or higher fastness to light in JIS-L 0842.

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CLAIMS

[Claim(s)]

[Claim 1]A fiber structure thing which a hydrophilic vinyl system monomer contains textiles by which graft polymerization was carried out 70 or less % of the weight, and is characterized by color fastness to light in JIS-L0842 being the 3rd more than class.

[Claim 2]The fiber structure thing according to claim 1 whose graft rate of the aforementioned textiles by which graft polymerization was carried out is 1 to 30 % of the weight.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the fiber structure thing and textiles where it was used for a curtain, a dress shirt, a blouse, a sport shirt, an underwear, bedding, a fatigue dress, a uniform, socks, a glove, a car sheet, etc., and hygroscopicity was improved and which were excellent in color fastness to light.

[0002]

[Description of the Prior Art]From before, the graft polymerization processing to the textiles of a hydrophilic vinyl system monomer, It is known as processing which gives deodorization nature and antibacterial properties to fiber structure things which give hydrophilic nature to polyester fiber, such as processing, a cellulosic fiber, regenerated cellulose system textiles, and an acrylic fiber, and processing which gives moisture absorption febrility.

[0003]However, the textile to which graft polymerization processing of such a hydrophilic vinyl monomer was carried out was difficult for color fastness to light using it at the place which has always hit light like [it is bad and] the clothing worn outdoors, and a curtain and a car sheet. Therefore, the actual condition is that that by which graft polymerization processing was carried out is used only for the use upon which light does not strike.

[0004]If graft polymerization processing is performed in the state of textiles, such as thread or textiles, knitting, and a nonwoven fabric, When aesthetic property became hard and it dyes and finished using reactive dye, acid dye, a direct color, a disperse dye, etc., since a homopolymer, a monomer, etc. adhered to the whole textile, dark color-ization was not completed but light-color-izing was a problem. When productivity was taken into consideration, color matching at the time of dyeing was difficult.

[0005]

[Problem(s) to be Solved by the Invention]An object of this invention is to provide the fiber structure thing and textiles where hygroscopicity was improved without spoiling aesthetic property as textiles, such as thread or textiles, knitting, and a nonwoven fabric, and which were excellent in color fastness to light.

[0006]

[Means for Solving the Problem]In order to attain this purpose, a fiber structure thing of this invention has the next composition. That is, they are a fiber structure thing and textiles which a hydrophilic vinyl system monomer contains textiles by which graft polymerization was carried out 70 or less % of the weight, and are characterized by color fastness to light in JIS-L0842 being the 3rd more than class.

[0007]

[Embodiment of the Invention]Hereafter, this invention is explained in detail. In this invention, a hydrophilic vinyl system monomer the textiles by which graft polymerization is carried out in the state of cotton (cotton). They are natural fibers, such as reproduction of synthetic fibers, such as polyester fiber, a polyamide fiber, a nylon fiber, and acrylic fibers, a rayon fiber, a triacetate fiber, etc., etc. or a semi-synthetic fiber, cotton, wool, and silk, etc. The fiber structure things in this invention are thread, textiles, knitting, a nonwoven fabric, and the textiles using these.

[0008]In this invention, it is a monomer which has a vinyl group of polymerization nature in molecular structure, and has hydrophilic radicals, such as acidic groups, such as carboxylic acid and sulfonic acid, and/or a salt of those, a hydroxyl group, and an amide group, as a hydrophilic vinyl system monomer.

[0009]Although these desirable are carboxylic acid system vinyl compounds and these metal salt, such as acrylic acid, methacrylic acid, maleic acid, crotonic acid, and butene tricarboxylic acid, is specifically raised, these may be used being independent or being mixed. Also in this, methacrylic acid and acrylic acid are preferred in respect of graft polymerization processing nature.

[0010]A graft rate is 1 to 30 % of the weight, and the cellulose fiber in this invention by which graft polymerization was carried out is a cellulose fiber to which the graft polymerization of the hydrophilic vinyl system monomer was carried out in the state of cotton. As for the graft rate of this cellulose fiber, less than 1 % of the weight is not enough as the effect of this invention. If it exceeds 30 % of the weight, hardening of cotton and a strong ductility fall will take place, and the process passage which is like [next spinner] worsens. A desirable graft rate is 3 to 25 % of the weight.

[0011]These monomers are faced carrying out graft polymerization to the textiles of the state of cotton, Ceric salt, such as azo polymerization initiators, such as peroxides, such as a redox system of hydrogen peroxide, divalent iron salt, etc., potassium persulfate, and ammonium, 2, and 2 azobis hydrochloride, and nitric acid 2 ammonium cerium, etc. are used as a polymerization initiator with these monomers. The method of adding during a processing bath, the method of giving beforehand textiles, etc. can be used for a polymerization initiator.

[0012]Although the method of textiles being immersed during processing baths, such as an exaggerated Mayer processing machine, and heat-treating them as the concrete method to which the graft polymerization of the hydrophilic vinyl system monomer is carried out in the state of cotton is mentioned, A processing condition is usually 180 or less min of 5 or more min below not less than 50 ** 170 **, and is 120 or less min of 30 or more min below not less than 60 ** 150 ** preferably. As a processing atmosphere, a nitrogen gas atmosphere is preferred. Then, inactivation processing of a polymerization initiator, washing processing, oils grant, a drying process, etc. are carried out as occasion demands.

[0013]The method of using activity energy lines, such as radiation, an electron beam, ultraviolet rays, and microwave, is also employable as a graft polymerization method.

[0014]When carrying out the graft polymerization of a hydrophilic vinyl system monomer in the state of textiles, such as textiles, knitting, and a nonwoven fabric, When aesthetic property dyes and finishes using reactive dye, a direct color, etc. which become hard, there are problems, like color matching at the time of dyeing with bad color fastness to light in which a color and textiles carry out ion rebounding and which they light-color-ize becomes difficult, but. When the cotton to which the graft of the hydrophilic vinyl system monomer was carried out in the state of cotton like this invention is mixed by other cotton, mixed spinning, interweaving, etc., aesthetic property hardening also has the effect that color fastness to light improves remarkably in a surprising thing that it is few and there are few light color-ized tendencies.

[0015]The content in the fiber structure thing of the textiles by which graft polymerization was carried out is 70 or less % of the weight, and is 40 or less % of the weight more preferably 55 or less % of the weight. If it exceeds 70 % of the weight, color fastness to light will worsen. Although the content of a minimum is decided according to the characteristic which needs hygroscopicity, deodorization nature, etc. although it is so desirable in respect of color fastness to light that there is little content, it is usually 1 to 3 % of the weight.

[0016]

[Example]Hereafter, an example explains this invention concretely. The valuation method of the fiber structure thing in an example and a comparative example and textiles is as follows.

[0017]Measurement of a graft rate (GT%): It calculated from the rate of a weight increment to the oven dry weight (W1) after carrying out graft polymerization and washing from the oven dry weight (W0) before a reaction.

Graft rate (GT%) = $(W1 - W0) \times 100 / W0$ [0018]Measurement of color fastness to light: It carried out by the method based on JIS-0842 (the colorfastness examining method for carbon arc lighting).

Measuring equipment used color-fastness-to-light measuring apparatus (a direct vent type ultraviolet-rays fadeometer, the Suga Test Instruments Co., Ltd. make). Carried out the 3rd class of light-proof exposure, and the 4th class of light-proof exposure, it was made to fade, and the gray scale standard estimated.

[0019]The example of manufacture of the cellulose fiber to which the graft polymerization of the hydrophilic vinyl monomer was carried out : The cotton cotton which carried out scouring treatment 20.0 g/l of methacrylic acid, It immersed and processed using the exaggerated Mayer processing machine by bath ratio [of 1:40 or 80 **] x60min in 0.6 g/l of ammonium ferrous sulfate, and the solution of 0.3 g/l of hydrogen peroxide. Then, rinsing and hot water rinsing were repeated. The graft rate at this time was about 10.15%. The processed cotton is called the following "GT cotton."

[0020]The example of manufacture of the polyester fiber to which the graft polymerization of the hydrophilic vinyl monomer was carried out : polyethylene terephthalate cotton (6.6dtex-64mm), 0.1 % of the weight of benzoyl peroxide, N-butylphthalimide, It was immersed in the graft polymerization bath which added 2.5 % of the weight of equivalent mixed monomers of acrylic acid and methacrylic acid to the emulsification solution which consists of a surface-active agent of sodium carbonate and a polyethylene glycol, and an anionic system, and was adjusted with the bath ratio 1:15. And 1hr graft polymerization was performed at 100 ** under a nitrogen gas atmosphere. Subsequently, carry out 10min processing with 80 ** hot water, and the solution of 3 g/L of sodium carbonate and 0.5 g/L of diethylenediamine tetraacetic acid-4-sodium salt is used after that, Repeatedly, after that, hot water rinsing was performed and 140 **x10min desiccation was carried out using the dryer until a treating solution was set to predetermined pH in processing of 70 **x10min. The graft rate at this time was about 10.35%. The processed polyester is called the following "GT polyester."

[0021]No. 40 count cotton yarn whose blended ratio of 50 % of the weight and raw cotton the blended ratio of Example 1 "GT cotton" is 50 % of the weight. (The following and cotton thread) were created and weaving of the broadcloth textiles (the cotton thread / warp density of the No. 40 count cotton thread x woof of No. 40 count warp 130/2.54cmx woof density 70/2.54 cm) was carried out.

[0022]No. 40 count cotton yarn whose blended ratio of 50 % of the weight and raw polyester the blended ratio of Example 2 "GT polyester" is 50 % of the weight. (The following and polyester yarn) were created and weaving of the broadcloth textiles (the polyester yarn / warp density of the No. 40 count polyester yarn x woof of No. 40 count warp 130/70 2.54cmx woof densities/2.54 cm) was carried out.

[0023]No. 40 count cotton yarn whose blended ratio of 10 % of the weight and raw cotton the blended ratio of Example 3 "GT cotton" is 90 % of the weight. (The following and cotton thread) were created and weaving of the broadcloth textiles (the cotton thread / warp density of the No. 40 count cotton thread x woof of No. 40 count warp 130/2.54cmx woof density 70/2.54 cm) was carried out.

[0024]No. 40 count cotton yarn whose blended ratio of 10 % of the weight and raw polyester the blended ratio of Example 4 "GT polyester" is 90 % of the weight. (The following and polyester yarn) were created and weaving of the broadcloth textiles (the polyester yarn / warp density of the No. 40 count polyester yarn x woof of No. 40 count warp 130/70 2.54cmx woof densities/2.54 cm) was carried out.

[0025]No. 40 count cotton yarn whose blended ratio of 80 % of the weight and raw cotton the blended ratio of the comparative example 1 "GT cotton" is 20 % of the weight. (The following and cotton thread) were created and weaving of the broadcloth textiles (the cotton thread / warp density of the No. 40 count cotton thread x woof of No. 40 count warp 130/70 2.54cmx woof densities/2.54 cm) was carried out.

[0026]No. 40 count cotton yarn whose blended ratio of 80 % of the weight and raw polyester the blended ratio of the comparative example 2 "GT polyester" is 20 % of the weight. (The following and polyester yarn) were created and weaving of the broadcloth textiles (the polyester yarn / warp density of the No. 40 count polyester yarn x woof of No. 40 count warp 130/70 2.54cmx woof densities/2.54 cm) was carried out.

[0027]The textiles obtained by Examples 1-4 and the comparative examples 1-2 were refined, bleached and dyed, and textiles were obtained. Dyeing was based on the following methods. Sumifix Supra Red 4BNF (made by Sumitomo Chemical Co., Ltd.) 0.1%omf Sumifix Supra Blue BRF (made by Sumitomo Chemical Co., Ltd.) 0.05%omf Sumifix Supra Yellow. 3RF (made by Sumitomo Chemical Co., Ltd.) 0.05%omf soda ash 1.0 g/l 60 °C x45min bath ratio Hot water rinsing and rinsing are repeated after 1:20 dyeing.

[0028]The result of having measured the color fastness to light of the textiles obtained by Examples 1-4 and the comparative examples 1-2 is shown in Table 1.

[0029]

例 (Examples)	(level 4 irradiation) 耐光4級照射	(level 3 irradiation) 耐光3級照射
実施例1 (Example 1)	4~3	4
実施例2	4~3	4
実施例3	5~4	5~4
実施例4	4	5~4
比較例1 (Comparison)	1	2~1
比較例2	1	2~1

[0030]

[Effect of the Invention]In this invention, it spins by mixed spinning etc. using the cotton which carried out graft polymerization processing, and a textile is obtained from this thread. Therefore, the textiles which were not able to be attained in the conventional graft polymerization processing textile and which are good aesthetic property and were excellent in color fastness to light can be provided.

[Translation done.]